

Claims

What is claimed is:

1. A particle trap assembly comprising:
a housing;
a plurality of particle traps positioned in said housing;
at least one valve attached to said housing and being movable between a first position and a second position; and
a flow area to one of said particle traps being relatively large when said valve is in said first position, but being a relatively small predetermined cross flow area that is greater than zero when said valve is in said second position.
2. The particle trap assembly of claim 1 wherein each of said particle traps includes an electrically conductive filter element attached to a pair of electric terminals that are exposed outside said housing.
3. The particle trap assembly of claim 1 including a plurality of subassemblies that each include a plurality of stacked particle traps and one quadrant of said housing.
4. The particle assembly of claim 3 wherein said particle traps divide said housing into an upstream volume with a flow area that is about equal to a flow area of a downstream volume.
5. The particle trap assembly of claim 3 wherein each of said particle traps is part of a different selectively energizable electric circuit

6. The particle trap assembly of claim 3 wherein each of said particle traps has a long dimension that deviates from a straight line.

7. The particle trap assembly of claim 3 wherein said stacked particle traps are separated from one another by ceramic mats.

8. A particle trap assembly comprising:
a housing having an inlet separated from an outlet by a plurality of flow paths;
a least one particle trap separating an upstream portion of one of said flow paths from a downstream portion;
a plurality of valves attached to said housing, and each being operable to open and close a selected one of said flow paths;
a plurality of cross flow passages disposed in said housing and fluidly connecting different pairs of said flow paths; and
each of said flow paths having a relatively large flow area, and each of said cross flow passages having a relatively small predetermined flow area.

9. The particle trap assembly of claim 8 wherein each of said particle traps includes an electrically conductive filter element attached to a pair of electric terminals that are exposed outside said housing.

10. The particle trap assembly of claim 8 including a plurality of subassemblies that each include a plurality of stacked particle traps and one quadrant of said housing.

11. The particle assembly of claim 10 wherein said particle traps divide said housing into an upstream volume with a flow area that is about equal to a flow area of a downstream volume.

12. The particle trap assembly of claim 10 wherein each of said particle traps is part of a different selectively energizable electric circuit

13. The particle trap assembly of claim 10 wherein each of said particle traps has a long dimension that deviates from a straight line.

14. The particle trap assembly of claim 10 wherein said stacked particle traps are separated from one another by ceramic mats.

15. A method of regenerating a particle trap in a particle trap assembly, comprising the steps of:

changing a flow area to one of a plurality of particle traps from a relatively large flow area to a relatively small predetermined cross flow area that is greater than zero; and

regenerating the one of the particle traps at least in part by heating the one of the particle traps while supplying an oxidizer via the relatively small predetermined cross flow area.

16. The method of claim 15 wherein said changing step includes a step of closing a valve; and

the supplying step includes supplying exhaust gas via a cross-flow passage.

17. The method of claim 16 wherein said heating step includes a step of sequentially energizing electrical circuits associated with different ones of a plurality of stacked particle traps.

18. A particle trap assembly comprising:

a housing;

at least one particle trap with an electrically conductive filter element dividing said housing into an upstream volume and a downstream volume; and

said upstream volume having a flow area about equal to a flow area of said downstream volume.

19. The particle trap assembly of claim 18 wherein said at least one particle trap includes a pair of electric terminals that are exposed outside said housing.

20. The particle trap assembly of claim 18 including a plurality of subassemblies that each include a plurality of stacked particle traps and one quadrant of said housing.

21. The particle trap assembly of claim 20 wherein each of said particle traps is part of a different selectively energizable electric circuit

22. The particle trap assembly of claim 20 wherein each of said particle traps has a long dimension that deviates from a straight line.

23. The particle trap assembly of claim 20 wherein said stacked particle traps are separated from one another by ceramic mats.